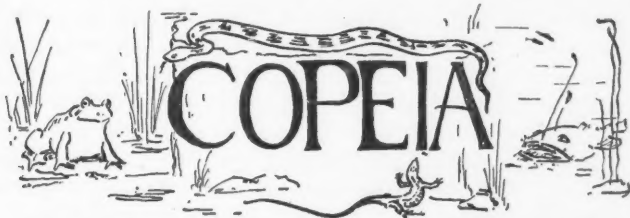


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THE RATTLING OF RATTLE SNAKES

The note in *Copeia* of September 16, 1920, by Armstrong Perry on the length of time an individual of *Crotalus horridus* kept up its rattle after there seemed to be no external stimulus or other reason for its doing so, incites me to record another observation of similar character.

The incident to be related occurred on the ranch of the Scripps Institution for Biological Research, near La Jolla, California, August 25, 1915, and pertained to the Red Diamond Rattlesnake (*C. atrox* var. *ruber*).

The snake was some twenty or thirty feet from a trail on which I was slowly and quietly walking, and discovered itself to me by setting up a vigorous whirl. As it was partly concealed by vegetation I should certainly have passed it by unnoticed but for its noise. In this instance its "warning" would surely have resulted in its death were I a sharer in the usual vengeance against rattlesnakes. As a matter of fact, I did nothing to disturb his peace of mind except to move around in various ways on my trail for the purpose of learning something about the rattle business.

That the animal was keenly watching my every movement, and was regulating his rattle to a considerable extent by what he saw, was manifest from the crescendos and diminuendos corresponding to my alternating periods of movement and perfect quiet. But there were diminutions, intensifications and momen-

tary cessations in the rattle beyond the variations in my movements. My impression was that the tail vibration tended to be irregularly rhythmic independently of the stimulus, though my observations were not sufficiently full to establish this surmise.

The snake was coiled when I first saw him, but the coil was not the strike coil. Nor did he change his position as long as I watched him. Even the head was moved very little, if at all. So far as I could make out, the only part of him in motion was the tip of his tail. Thinking that as good a test as I could make of my presence as a rattle enticing stimulus would be to move slowly and quietly away; this I did. At about eighty paces from the snake, the trail, curving around a steep slope, took me out of sight of his position and beyond the sound of his rattle. The sound became so faint at this point that I could not decide positively whether it actually stopped or continued but inaudibly to me. I am quite sure, however, from its unevenness, that its general intensity of the whirl gradually diminished as I moved away. Nor could I tell certainly whether I was in range of his vision the whole time.

Why I so unfortunately failed to return a little later to see what was going on, and to take other means of testing the snake's behavior, I do not now recall. Probably I imagined I had more important duties elsewhere, though now I doubt this. The entire time of the observation was something more than twenty minutes.

At the time of rattlesnake encounter thus narrated, I was specially interested in the different behavior of this individual from that of one of the same species I came upon a few years before. On the earlier occasion the snake was almost in the path I was traveling, and I became aware of his presence only by seeing him where he was within easy kicking or striking distance from me. Furthermore, I had an iron bar in my hand at this time, one blow with which, had I chosen to deal it, would have finished the life of the

snake. (I was wholly unarmed during my tete-a-tete with rattler No. 2). But in spite of a variety of pokings with my iron bar, I failed to elicit from this individual, rattle or any real effort to strike, or other evidence of fear or solicitude about safety. Indeed, it almost seemed as though this creature was abnormal in some way, though I saw no evidence of this beyond what has just been indicated.

After I had spent as much time with the snake as I thought profitable, I went on my way and he did the same, in seemingly normal fashion.

Wherefore the difference in behavior of these two individual rattlesnakes? Any answer I might give to the question would be almost wholly speculative. The indubitable facts deserving special attention are these: Snake No. 1 made not the slightest effort toward self-preservation, though under the provocation of great danger. On the other hand, snake No. 2, while not in the least danger, set up a noise which, so far as the act itself was concerned, was an invitation to certain death.

Since writing the above I have mentioned the case to my colleague, Dr. F. B. Sumner, whose work leads him a good deal over the mesas in this region. He remarks, "I can duplicate your observation several times over." Surely there is much yet to be learned about the ways of rattlesnakes!"

WM. E. RITTER.

La Jolla, Calif.

THE LIFE HISTORY OF THE AMERICAN NEWT

I can add a fact to the notes on this species (*Notophthalmus viridescens*) by Mr. P. H. Pope, in Copeia, No. 91. Namely that in this locality the newts do not stay in the water during the summer, but losing the dermal fin on the tail leave the water sometime in the spring and do not enter it again till about November. Time and time again have I tried to get newts in early

fall in places where they were usually common later on, but without success. On November 6, 1915, while out collecting I got to looking for salamanders and among others found half a dozen of the land form, all full grown and apparently getting ready to enter the water. In near-by pools I caught about ten more, mostly with roughened skin and narrow tail, showing that they had only recently entered the water.

In the spring of 1920 I kept several newts for some months in an aquarium, but they lost the dermal fin to the tail, became rougher skinned and stayed out of the water as much as possible till I got tired of seeing them look miserable, and set them free in some thick ivy vines in my garden where they could get plenty of shelter and moisture. I did not note the date. My experience agrees with that of Mr. Pope, that the land form is not often met with and also that the adult water form is always fully grown. Of course, in this locality where the land form appears to be a summer as well as an early stage, the land form attains as large a size as the water form.

C. S. BRIMLEY, *Raleigh, N. C.*

